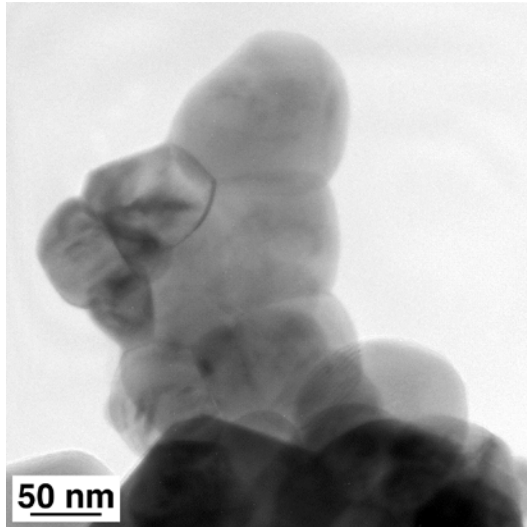


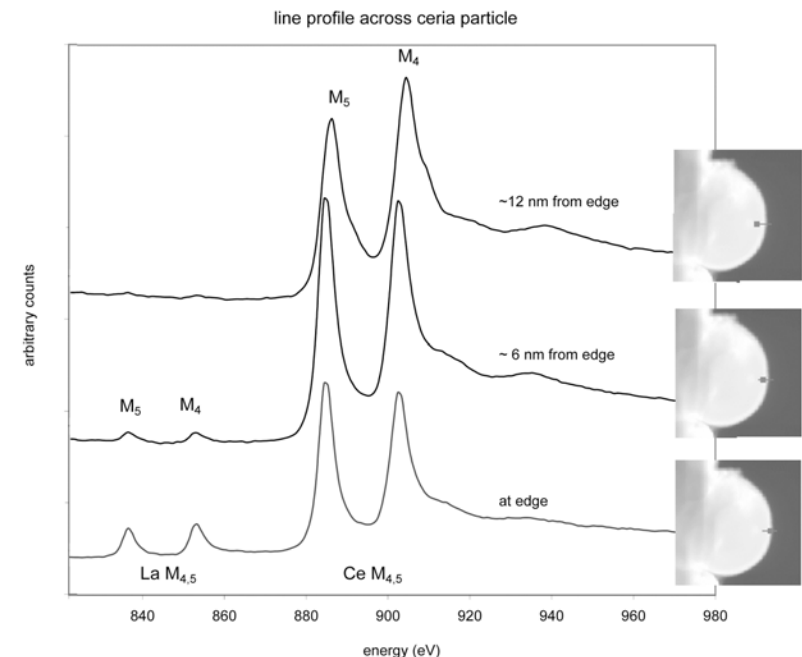
Polishing Glass-Ceramics with Ceria

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Transmission electron micrograph of agglomerated ceria powder

Ceria is the polishing media of choice for glass and glass ceramics. The future use of glass ceramics as hard-drive platters places extreme requirements on the surface flatness. The acceptable variations are much smaller than the size of the ceria particles.



Using energy-loss spectrometry in the TEM, we show that the surface of the particles is chemically very different to the “bulk” composition

We are working to understand how the polishing process occurs and hence how industry can improve the performance of the polishing powders. One approach we are using involves exploring what we really mean by ‘ceria’ as an abrasive and then using chemistry to design new particles with controlled compositions.

Microscopy in the Schools

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During the past 3 years, 3 undergraduate students, and 4 graduate students have participated in this program. Our group is also active in outreach both in bringing microscopy into the schools and through the Twin Cities Science Fair. Here Julia Deneen is helping a 5th-grade student use the microscope to look at small animals and rocks today: tomorrow it will be the nanoparticles we are using in chemical-mechanical polishing.



Chris Perrey, another graduate student in our program, interests two generations: parents are always welcome at these activities and increase the likelihood that the lessons will continue at home.